

## The Next Generation Of GeoThermal: The Future Of Energy?

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Harnessing naturally occurring heat trapped between layers of rock below the earth's surface, geothermal power plants are capable of supplying clean, renewable electricity around the clock. This valuable trait should position geothermal power as an important asset within [emerging sustainable energy systems](#) [1] that rely heavily on intermittent renewables such as [wind and solar](#) [2].

But despite more than 50 years of commercial activity, geothermal power's path has been more rocky than disruptive.

That's largely because the medium- to high-temperature sites required by conventional geothermal power plants — known as hydrothermal sites — are [limited](#) [3]. In the United States, which leads the world [\[PDF\]](#) [4] in geothermal power with an installed operating generating capacity of about 3,790 megawatts as of the end of 2013, development is highly concentrated in the West, primarily California and Nevada. This adds up to just 0.33 percent of the country's electric generating fleet, according to the Federal Energy Regulatory Commission's (FERC) most recent infrastructure update [\[PDF\]](#) [5]. Among electric fuel sources tracked by FERC, only waste heat and "other" account for less.

But there may be a solution to geothermal power's geographic limitation, which could open up the way for this subterranean resource to play a much greater role in energy systems of the future.

### A novel approach to geothermal

Funded by National Science Foundation and Department of Energy grants, a team of scientists from Lawrence Livermore National Laboratory (LLNL), the University of Minnesota (U of M) and Ohio State University (OSU) has developed a novel geothermal power plant design that leverages unwanted, captured carbon dioxide to boost both output and efficiency compared to conventional geothermal plants. The approach also extends the potential reach of geothermal power generation across the country. Scientists illustrate their fresh approach to geothermal (Credit: EnergyPathways.org)

"There's an opportunity to deploy geothermal in many more places than possible with traditional plant designs," said Tom Buscheck, a geoscientist at LLNL, in an interview following his presentation of the concept at the American Geophysical Union's [annual meeting](#) [6] in San Francisco last week. "We can harvest heat over much larger areas, in sedimentary formations with very permeable rock. I am hopeful. Geothermal has really been overlooked."

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The research team believes it can enable geothermal power generation in most U.S. states west of the Mississippi River and even on the East Coast in states such as [West Virginia](#) [7]. A spinoff of the University of Minnesota, Heat Mining Co. LLC, expects to begin construction on a [pilot plant](#) [8] next year that could open the way to future commercial development in unconventional locations.

But, said Buscheck, the geothermal community needs to think out of the box.

[Read on](#) [9] for how this new plant design works...

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[1] <http://www.greenbiz.com/blog/2013/12/19/10-sustainable-energy-trends-shook-business-2013>

[2] <http://www.greenbiz.com/topic/renewable-energy>

[3] [http://www.nrel.gov/gis/images/geothermal\\_resource2009-final.jpg](http://www.nrel.gov/gis/images/geothermal_resource2009-final.jpg)

[4] <http://geo-energy.org/events/2013%20International%20Report%20Final.pdf>

[5] <http://www.ferc.gov/legal/staff-reports/2013/oct-energy-infrastructure.pdf>

[6] <http://fallmeeting.agu.org/2013/>

[7] <http://www.greenbiz.com/news/2010/10/07/google-warms-west-virginias-vast-geothermal-potential>

[8] <http://finance-commerce.com/2013/10/next-for-u-geothermal-effort-pilot-plant/>

[9] <http://www.greenbiz.com/blog/2013/12/20/how-next-gen-geothermal-could-boost-future-energy>